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**United States Patent** [19]

Hotti et al.

[11] **Patent Number:** 6,144,941[45] **Date of Patent:** Nov. 7, 2000[54] **INTELLIGENT TRANSACTION**[75] **Inventors:** Timo Hotti; Jarmo Parkkinen, both of Helsinki, Finland[73] **Assignee:** Solid Information Technology Oy, Helsinki, Finland[21] **Appl. No.:** 09/028,940[22] **Filed:** Feb. 24, 1998[30] **Foreign Application Priority Data**

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[51] **Int. Cl.<sup>7</sup>** ..... G06F 17/60[52] **U.S. Cl.** ..... 705/4; 705/26; 705/30; 707/10[58] **Field of Search** ..... 707/1-10, 100-104, 707/200-206; 705/2, 4, 26, 27, 30, 40, 42; 709/203, 216, 250; 713/200, 201[56] **References Cited****U.S. PATENT DOCUMENTS**

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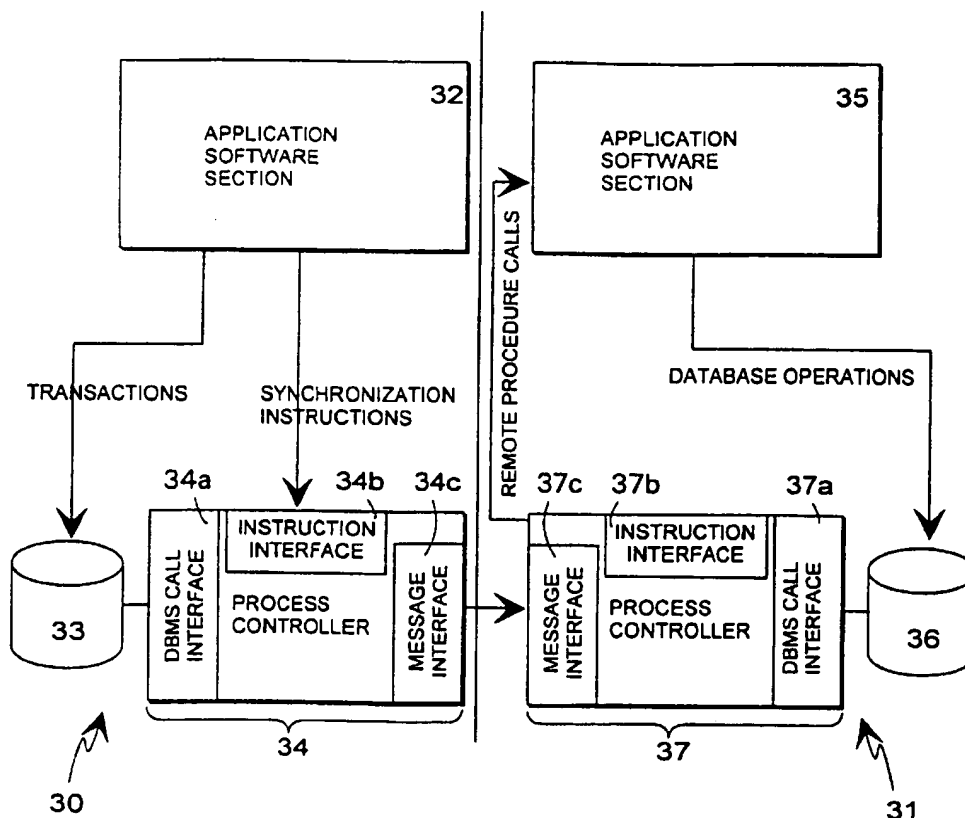
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*Primary Examiner*—Ruay Lian Ho*Attorney, Agent, or Firm*—Locke Liddell & Sapp LLP

## [57]

**ABSTRACT**

A plurality of steps, which are intended to modify the data in a transaction, form a transaction (40) comprising statements (41, 42, 43). In the method according to the invention there is formed a data exchange space (47) common to the transaction in order to make the parameters available to the statements belonging to the transaction and in order to transmit data between the statements belonging to the transaction. The system (30) maintaining the first version of the database is arranged to store the modifications to be made in the database as transactions, which comprise statements as well as parameters, both regarding the statements and regarding the transaction. The system (31) maintaining the second database version is arranged to form a transaction on the basis of the message it receives, whereby the transaction comprises statements, and to reserve an information exchange space (47) in the system memory in order to make the parameters available to the statements belonging to the transaction and in order to transmit data between the statements belonging to the transaction.

**8 Claims, 3 Drawing Sheets**

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TITLE: Intelligent transaction

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Detailed Description Text - DETX (5):

The mainframe receives the messages transmitted by the PC via the message interface 37c and stores them in its own message store (not particularly shown in the figure) to wait for the transactions to be directed to the master database. The last mentioned process can be automatic, for instance in a regularly repeated synchronisation run, or it can be made when the message store is filled, or it can be made as a response to a synchronisation instruction given by the mainframe operator. Each message is processed in the mainframe as a process comprising tasks (typically transactions and their statements and parameters), which are controlled by the synchronisation process controller in block 37. Within the process the process controller processes the transactions conveyed by the message. As the first step in the process it reserves a particular space in the computer memory for the transaction's bulletin board. An exemplary transaction parameter, which the process controller can write on the bulletin board, is a parameter (DatabaseType) indicating the type of the database, which at this stage can be given the value "Master". Via the bulletin board this parameter is transmitted to those transaction statements, whose function depends on whether the processed **database is a copy** or a master. The value "Master" indicating the database type means particularly that the application will not control the validity of the transactions, but the control must be based on the logical characteristics which the transaction contains according to the invention.

Detailed Description Text - DETX (15):

Let us assume that a transaction comprising the three above mentioned statements is successful in the **copy database** 33, whereby the status of the order generated by the statement 41 is "Active", the status of the bookkeeping entry generated by the statement 42 is "Approved", and the balance of the account has been updated according to the statement 43. The transaction causing these modifications is also saved in the **copy database** maintained by

the PC. The next step is to synchronize the databases, so that the modifications represented by the transaction are transmitted to the master database 36.

Detailed Description Text - DETX (16):

The final validity of the transaction in the master database can not yet be confirmed using the above presented business rules in that stage when the modifications are made in the copy database, because either the copy database does not at all contain the stock bookkeeping, or in the best case the copy database bookkeeping information represents the stock situation only at that moment when the copy was made. Thus the transaction must operate differently, depending on whether it acts on the copy database or on the master database.

Detailed Description Text - DETX (18):

According to the above presented exemplary embodiment the intelligent transaction according to the invention can contain in one or more statements (even in all statements) logical operations, which are used to identify the transaction's validity before the modifications represented by the statement are made in the database. The information generated by the logical operations are transmitted from one statement the another statement via the common bulletin board of the transaction, so that it is not necessary that the statements refer directly to each other, and it is even not necessary that the statements contain any information about which other statements are included in the transaction. With the aid of logical operations the transaction's statements can cause different modifications of the database, depending on whether the transaction acts on a copy database or on the master database.

Current US Cross Reference Classification - CCXR (2):

705/30